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EXAMINER	
FLANDERS, ANDREW C	

ART UNIT	PAPER NUMBER
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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/886,958	DOWLING ET AL.	
	Examiner	Art Unit	
	Andrew C. Flanders	2615	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *11 May 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-35 and 37-93* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-35 and 37-93* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant's arguments, filed 11 May 2006, with respect to the rejection(s) of the claim(s) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Eastty (U.S. Patent 6,021,204)

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claim 21 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 21 attempts to further limit step (A) of claim 1 by claiming to receive the audio input in analog form and converting the audio input to digital form. It is unclear to the examiner how a signal can be received in a digital music file format but also received in analog form. Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 3, 5 – 7, 9 – 17, 20 – 22, 24, 25, 27 – 32, 35, 37, 39, 40, 42 – 48, 51, 53, 54, 92 and 93 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kiltz (U.S. Patent 5,191,319) in view of Eastty (U.S. Patent, 6,021,204) and in further view of Suzuki (U.S. Patent 6,362,411)

Regarding **Claim 1**, Kiltz discloses:

A method for executing a lighting program to control a plurality of lights (Fig. 1), the method comprising acts of

(A) receiving an audio input (Fig 1 element 2)

(B) processing the audio input to determine at least one characteristic of the audio input (Fig. 1 elements 3 - 80)

(C) generate control signals to control the plurality of lights (i.e. activation of one or more lamp driver circuits to activate a plurality of colored light sources (LEDs) according to a preselected assignment of light color to each audio frequency band defined by the decode logic; col. 4 lines 56 – 65), wherein the plurality of lights display a lighting sequence comprising at least two lighting effects spaced in time (i.e. playing music is continuous, therefore, as one segment of audio is played back, one effect will be displayed, as a second segment is played (followed continuously at a later time) a

second effect will be displayed; as is shown in col. 3 line 26 which discloses multiple signals); and

(D) generating at least one of the control signals based at least in part on the at least one characteristic of the audio input (i.e. activation of one or more lamp driver circuits to activate a plurality of colored light sources (LEDs) according to a preselected assignment of light color to each audio frequency band defined by the decode logic; col. 4 lines 56 – 65).

Kiltz does not explicitly disclose that the audio input is in a digital music file format; the determination is done by digitally processing the audio input; or the method is a method for executing a lighting program or executing the lighting program to generating the control signals.

While Kiltz does not disclose the audio being in a digital music file format or determining a characteristic by digitally processing the audio input, modifying the input of the audio and analyzing it as taught by Kiltz in the analog domain to function in the digital domain is known in the art.

Eastty teaches inputting a digital audio signal (Figs. 1 and 2; col. 2 lines 17 – 38) to digitally analyze and determine the intensity and frequency characteristics of the audio signal; Figs 1, 2, 3; for the purpose of generating a particular color in response; col. 2 lines 14 – 40.

Applying the teachings of Eastty to take the place of the analog determination in Kiltz discloses:

audio input is in a digital music file format (i.e. the input in Kiltz Fig. 1 element 2 is replaced by Eastty Fig. 1 element 10); the determination is done by digitally processing the audio input (col. 2 lines 14 – 40).

It would have been obvious to one of ordinary skill in the art at the time of the invention to apply the teachings of Eastty to Kiltz. It is well known and recognized that the digital processing of audio signals is superior to the analog processing due to the lower incidence of noise that occurs in the processing. Kiltz even discloses that the signals should be of high quality such that the noise level contained therein is very small; col. 3 lines 25 – 35.

Furthermore the combination fails to explicitly disclose he method as a method for executing a lighting program or executing the lighting program to generating the control signals. Kiltz does disclose the generation of the control signals as shown above for controlling a plurality of lights. However, this is mostly done via hardwired logic as is shown in Fig. 1.

Suzuki discloses extracting control data from waveforms (abstract) and the invention may be implemented in hardware such as hardwired logic or software programs; col. 24 lines 44 – 61. While Suzuki is disclosing implementing the software portions of the invention into hardware, the inverse would also have to be possible (i.e. if software can be transformed and implemented into hardware, the hardware can be transformed and implemented in software.) Again, it should be stated that hardwired logic circuits and various other digital circuits as well as software logic are art recognized equivalents.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Kiltz hardware implementation to operate in a software environment. One would have been motivated to do so to reduce the number of parts required to produce the Kiltz invention as the combination would only require one processor instead of an entire hardwired circuit. The Suzuki reference substantiates the fact that hardware and software are art recognized equivalents in such an area of application and thus are obvious variants or substitutes for each other for the purpose of control.

Furthermore, the combinations fails to explicitly disclose the light sources as LEDs. However, the Examiner takes official notice that it would have been obvious to one of ordinary skill in the art to use LEDs in place of the lamps disclosed by the combination (this is further shown in Drago's use of LEDs in a similar invention, US 5,461,188 as cited in the IDS). One would have been motivated to do so to reduce the power consumption of the combination. It is well known in the art that LEDs typically require less power to drive than standard lamps thus reducing this consumption would be desirable.

Regarding **Claim 20**, the method of claim 1 as rejected above makes obvious all limitations claimed in claim 20 with the exception of the method now being performed via a computer readable medium. As shown above in the rejection of claim 1 by Suzuki, it is well known in the art to implement hardware in a software environment. Thus claim 20 is made obvious for the same reasons stated above regarding claim 1.

Regarding **Claim 21**, in addition to the elements stated above regarding claim 20, the combination further discloses:

wherein the act (A) includes an act of receiving the audio input in analog form and converting the audio input to digital form (i.e. Kiltz further discloses receiving an analog music signal; Fig. 1 element 2 and converting it to a digital signal with an analog to digital converter; Fig. 1 element 60).

Regarding **Claim 92**, the method of claim 1 as rejected above makes obvious all limitations claimed in claim 92 with the exception that the light show anticipates changes in the audio input. However, as shown in previous actions, AskOxford.com provides one definition for anticipate as "act or happen before". As such, the combination does act before changes in the audio input. As shown above, they system acts at point A and then again at point B, in other words it acts before change, point B being considered to be the first time. Thus claim 92 is made obvious for the same reasons stated above regarding claim 1.

Regarding **Claims 3 and 22**, in addition to the elements stated above regarding claims 1 and 20, he combination further discloses:

wherein the act (B) includes an act of performing a frequency transformation of the audio input to determine an activity level within at least one frequency band, and wherein the at least one characteristic of the audio input relates to the activity level within the at least one frequency band (i.e. Kiltz further discloses the decoder operates

on the multiple binary signal to divide the audio frequency spectrum represented by these signals into a plurality of contiguous frequency bands (col. 4 lines 43 – 46)).

Regarding **Claims 5, and 24**, in addition to the elements stated regarding claims 1 and 20, the combination further discloses:

wherein the act (b) includes an act of determining a volume of the audio input, and wherein the at least one characteristic of the audio input relates to the volume (i.e. Kiltz further discloses circuits responsive to audio signal amplitude cause the display brightness to vary (abstract)).

Regarding **Claims 6 and 25**, in addition to the elements stated above regarding claims 1 and 20, the combination further discloses:

wherein the act (B) includes an act of determining an intensity of the audio input, and wherein the at least on characteristic of the audio input relates to the intensity (i.e. Kiltz further discloses each lamp driver controls the brightness output of a single light source in accordance with the audio amplitude envelope signal (col. 4 lines 57 – 60)

Regarding **Claim 7**, in addition to the elements stated above regarding claim 1, the combination further discloses:

wherein the act (A) includes an act of receiving the audio as part of an audio/video signal (i.e. Kiltz further discloses that the music source can be any means by which audio information is translated into electronic signals (col. 3 lines 26 – 31))

The combination does not explicitly state the audio is part of a video signal, however, Examiner takes official notice that composite audio and video signals are well known in the art. It would have been obvious to one of ordinary skill in the art to use a combination audio/video signal with the combination. One would have been motivated to do so in order to use the combination with any audio signal that a user may typically encounter.

Regarding **Claims 9 and 27**, in addition to the elements stated above regarding claims 1 and 20, the combination further discloses:

wherein the act (C) includes an act of executing a lighting program having at least one variable that has an input value, and wherein the act (D) includes an act of providing the at least one characteristic of the audio input as the input value of the at least one variable (i.e. Kiltz further discloses each lamp driver controls the brightness output of a single light source in accordance with the audio amplitude envelope signal and the audio frequency band selected by the decode logic and activation of one or more lamp driver circuits to activate a plurality of colored light sources (LEDs) according to a preselected assignment of light color to each audio frequency band defined by the decode logic (col. 4 lines 49 – 65)).

Regarding **Claims 10 and 28**, in addition to the elements stated above regarding claims 1 and 20, the combination further discloses:

wherein the lighting program is a first lighting program and wherein the method further includes an act of, during execution of the first lighting program in the act (C), switching to execution of a second lighting program in response to the at least one characteristic of the audio input (i.e. Kiltz discloses a table of properties disclosing which lights are on when a certain frequency band is present (Fig. 6). It is inherent that as the frequency changes, so do the lighting schemes, and thus the claimed programs).

Regarding **Claims 11 and 29**, in addition to the elements stated above regarding claims 1 and 20, the combination further discloses:

during execution of the lighting program in the act (C), assigning an effect to at least one of the plurality of LEDs based at least in part on the at least one characteristic of the audio input (i.e. Kiltz further discloses each lamp driver controls the brightness output of a single light source in accordance with the audio amplitude envelope signal col. 4 lines 57 – 60)

Regarding **Claims 12 and 30**, in addition to the elements stated above regarding claims 1 and 20, the combination further discloses:

during execution of the lighting program in the act (C), determining a parameter of at least one effect assigned to at least one of the plurality of LEDs based at least in part on the at least one characteristic of the audio input (i.e. Kiltz further discloses each lamp driver controls the brightness output of a single light source in accordance with the audio amplitude envelope signal col. 4 lines 57 – 60).

Regarding **Claim 13**, in addition to the elements stated above regarding claim 1, the combination further discloses:

wherein the method further includes an act of providing a cue table that identifies various actions to be taken during execution of the lighting program in response to at least two inputs received at the cue table, and wherein the act (D) includes acts of: providing at least two characteristics of the audio input as inputs to the cue table (i.e. Kiltz further discloses a gain to brightness transfer characteristic (fig. 2B) and a Frequency to color table (fig. 6); and

during execution of the lighting program, generating at least one of the control signals in response to an output of the cue table (i.e. and each lamp driver controls the brightness output of a single light source in accordance with the audio amplitude envelope signal and the audio frequency band selected by the decode logic and activation of one or more lamp driver circuits to activate a plurality of colored light sources (LEDs) according to a preselected assignment of light color to each audio frequency band defined by the decode logic (col. 4 lines 49 – 65).

Regarding **Claim 14**, in addition to the elements stated above regarding claim 1, the combination further discloses:

wherein the lighting program performs a mapping from the at least one characteristic of the audio input to the at least one of the control signals (i.e. Kiltz further discloses a gain to brightness transfer characteristic (fig. 2B)

wherein the method further includes an act of providing a cue table that identifies various actions to be taken during execution of the lighting program in response to at least two inputs received at the cue table, and wherein the act (D) includes acts of: providing at least two characteristics of the audio input as inputs to the cue table (i.e. a gain to brightness transfer characteristic (fig. 2B) and a Frequency to color table (fig. 6); and

during execution of the lighting program, changing the mapping performed by the lighting program in response to an output of the cue table (i.e. and each lamp driver controls the brightness output of a single light source in accordance with the audio amplitude envelope signal and the audio frequency band selected by the decode logic and activation of one or more lamp driver circuits to activate a plurality of colored light sources (LEDs) according to a preselected assignment of light color to each audio frequency band defined by the decode logic (col. 4 lines 49 – 65)

Regarding **Claims 15 and 93**, in addition to the elements stated above regarding claims 1 and 20, the combination further discloses:

wherein at least one characteristic of the audio signal includes at least first and second characteristics (i.e. Kiltz further discloses a Frequency to color table with the frequency divided into ranges (fig. 6); and

wherein the lighting program performs a mapping function from the first characteristic of the audio input to the at least one of the control signals and wherein the act (D) includes an act of, during execution of the lighting program in the act (C),

changing the mapping function performed by the lighting program in response to the second characteristic of the audio input (i.e. the audio frequency band selected by the decode logic and activation of one or more lamp driver circuits to activate a plurality of colored light sources (LEDs) according to a preselected assignment of light color to each audio frequency band defined by the decode logic (col. 4 lines 49 – 65)

Regarding **Claims 16 and 31**, in addition to the elements stated above regarding claims 15 and 93, the combination further discloses:

wherein the lighting program is a first lighting program and wherein the method further includes an act of, during execution of the first lighting program in the act (C), switching to execution of a second lighting program in response to the at least one characteristic of the audio input (i.e. Kiltz discloses a table of properties disclosing which lights are on when a certain frequency band is present (Fig. 6). It is inherent that as the frequency changes, so do the lighting schemes and thus the claimed programs)

Regarding Claims **17 and 32**, in addition to the elements stated above regarding claims 1 and 20, the combination further discloses:

wherein the act (B) includes an act of digitally processing the audio input to determine a plurality of characteristics of the audio input (i.e. Kiltz further discloses a decoder that operates on the multiple binary signal to divide the audio frequency spectrum represented by these signals into a plurality of contiguous frequency bands (col. 4 lines 43 – 46)

wherein the act (D) includes an act of, during execution of the lighting program in the act (C), generating the control signals based at least in part on the plurality of characteristics of the audio input (i.e. and activation of one or more lamp driver circuits to activate a plurality of colored light sources (LEDs) according to a preselected assignment of light color to each audio frequency band defined by the decode logic (col. 4 lines 56 – 65).

Regarding **Claim 35**, Kiltz discloses:

An apparatus to control a plurality of lights (Fig. 1) the apparatus comprising:

at least one input to receive an audio input (Fig. 1 element 2)

an audio decoder to process the audio input to determine at least one characteristic of the audio input (i.e. Fig. 1 elements 3 - 80)

generating control signals to control the plurality of LEDs (i.e. and activation of one or more lamp driver circuits to activate a plurality of colored light sources (LEDs) according to a preselected assignment of light color to each audio frequency band defined by the decode logic col. 4 lines 56 – 65),

controlling the plurality of LEDs to display a lighting sequence comprising at least two lighting effects spaced in time (i.e. playing music is continuous, therefore, as one segment of audio is played back, one effect will be displayed, as a second segment is played (followed continuously at a later time) a second effect will be displayed; as is shown in col. 3 line 26 which discloses multiple signals); and

generating at least one of the control signals based at least in part on the at least one characteristic of the audio input (i.e. activation of one or more lamp driver circuits to activate a plurality of colored light sources (LEDs) according to a preselected assignment of light color to each audio frequency band defined by the decode logic; col. 4 lines 56 – 65).

Kiltz fails to explicitly disclose receiving the audio input in a digital music file format, an audio decoder to digitally process the audio input , the apparatus is for executing a lighting control program that performs the above steps, at least one storage medium to store the lighting program, at least one controller, coupled to the audio decoder and the at least one storage medium to execute the lighting program to generate controls signals.

While Kiltz does not disclose receiving the audio input in a digital music file format, an audio decoder to digitally process the audio input, modifying the input of the audio and analyzing it as taught by Kiltz in the analog domain to function in the digital domain is known in the art.

Eastty teaches inputting a digital audio signal (Figs. 1 and 2; col. 2 lines 17 – 38) to digitally analyze and determine the intensity and frequency characteristics of the audio signal; Figs 1, 2, 3; for the purpose of generating a particular color in response; col. 2 lines 14 – 40.

Applying the teachings of Eastty to take the place of the analog determination in Kiltz discloses:

eceiving the audio input in a digital music file format (i.e. the input in Kiltz Fig. 1 element 2 is replaced by Eastty Fig. 1 element 10); an audio decoder to digitally process the audio input (col. 2 lines 14 – 40; and Fig. 1).

It would have been obvious to one of ordinary skill in the art at the time of the invention to apply the teachings of Eastty to Kiltz. It is well known and recognized that the digital processing of audio signals is superior to the analog processing due to the lower incidence of noise that occurs in the processing. Kiltz even discloses that the signals should be of high quality such that the noise level contained therein is very small; col. 3 lines 25 – 35.

Furthermore, the combination fails to explicitly disclose the apparatus is for executing a lighting control program that performs the above steps, at least one storage medium to store the lighting program, at least one controller, coupled to the audio decoder and the at least one storage medium to execute the lighting program to generate controls signals.

Suzuki discloses extracting control data from waveforms (abstract) and the invention may be implemented in hardware such as hardwired logic or software programs; col. 24 lines 44 – 61. While Suzuki is disclosing implementing the software portions of the invention into hardware, the inverse would also have to be possible (i.e. if software can be transformed and implemented into hardware, the hardware can be transformed and implemented in software.) Again, it should be stated that hardwired logic circuits and various other digital circuits as well as software logic are art recognized equivalents.

Modifying the combination to operate via a software program disclosed by Suzuki reads upon the lighting program and executing the lighting program to generate control signals. A software program inherently requires a storage medium and thus reads upon the at least one storage medium to store the lighting program. Further, a controller such as a processor, must be inherently present in order to run the software and thus reads upon the at least one controller coupled to the audio decoder and the at least one storage medium. Assuming, for the sake of the argument, that these elements are not inherent, they are obvious variants. It is obvious to one of ordinary skill in the art that it is desirable, if not almost necessary to store a software program on a storage medium and execute it with a processor.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Kiltz hardware implementation to operate in a software environment. One would have been motivated to do so to reduce the number of parts required to produce the Kiltz invention as the combination would only require one processor instead of an entire hardwired circuit. The Suzuki reference substantiates the fact that hardware and software are art recognized equivalents in such an area of application and thus are obvious variants or substitutes for each other for the purpose of control.

Furthermore, the combinations fails to explicitly disclose the light sources as LEDs. However, the Examiner takes official notice that it would have been obvious to one of ordinary skill in the art to use LEDs in place of the lamps disclosed by the combination (this is further shown in Drago's use of LEDs in a similar invention, US 5,461,188 as cited in the IDS). One would have been motivated to do so to reduce the

power consumption of the combination. It is well known in the art that LEDs typically require less power to drive than standard lamps thus reducing this consumption would be desirable.

Regarding **Claim 37**, in addition to the elements stated above regarding claim 35, the combination further discloses:

wherein the audio decoder performs a frequency transformation of the audio input to determine an activity level within at least one frequency band, and wherein the at least one characteristic of the audio input relates to the activity level within the at least one frequency band (i.e. Kiltz further discloses the decoder operates on the multiple binary signal to divide the audio frequency spectrum represented by these signals into a plurality of contiguous frequency bands (col. 4 lines 43 – 46)

Regarding **Claim 39**, in addition to the elements stated regarding claim 35, the combination further discloses:

wherein the decoder determines a volume of the audio input, and wherein the at least one characteristic of the audio input relates to the volume (i.e. Kiltz further discloses circuits responsive to audio signal amplitude cause the display brightness to vary (abstract)

Regarding **Claim 40**, in addition to the elements stated above regarding claim 35, the combination further discloses:

wherein the audio decoder determines an intensity of the audio input, and wherein the at least one characteristic of the audio input relates to the intensity (i.e. Kiltz further discloses each lamp driver controls the brightness output of a single light source in accordance with the audio amplitude envelope signal (col. 4 lines 57 – 60).

Regarding **Claims 42 and 53**, in addition to the elements stated above regarding claims 35 and 51, the combination further discloses:

wherein the lighting program has at least one variable that has an input value, and wherein the at least one controller provides the at least one characteristic of the audio input as the input value of the at least one variable (i.e. Kiltz further discloses each lamp driver controls the brightness output of a single light source in accordance with the audio amplitude envelope signal and the audio frequency band selected by the decode logic and activation of one or more lamp driver circuits to activate a plurality of colored light sources (LEDs) according to a preselected assignment of light color to each audio frequency band defined by the decode logic (col. 4 lines 49 – 65).

Regarding **Claim 43**, in addition to the elements stated above regarding claim 35, the combination further discloses:

wherein the lighting program is a first program, wherein the at least one storage medium further stores a second lighting program, and wherein the at least one

controller, during execution of the first lighting program, switches to the execution of the second lighting program in response to the at least one characteristic of the audio input (i.e. Kiltz discloses a table of properties disclosing which lights are on when a certain frequency band is present (Fig. 6). It is inherent that as the frequency changes, so do the lighting schemes and thus the claimed program)

Regarding **Claim 44**, in addition to the elements stated above regarding claim 35, the combination further discloses:

wherein the at least one controller, during execution of the lighting program, assigns an effect to at least one of the plurality of LEDs based at least in part on the at least one characteristic of the audio input (i.e. Kiltz further discloses each lamp driver controls the brightness output of a single light source in accordance with the audio amplitude envelope signal (col. 4 lines 57 – 60)

Regarding **Claim 45**, in addition to the elements stated above regarding claim 35, the combination further discloses:

wherein the at least one controller, during execution of the lighting program, determines a parameter of at least one effect assigned to at least one of the plurality of LEDs based at least in part on the at least one characteristic of the audio input (i.e. Kiltz further discloses each lamp driver controls the brightness output of a single light source in accordance with the audio amplitude envelope signal (col. 4 lines 57 – 60)

Regarding **Claim 46**, in addition to the elements stated above regarding claim 1, the combination further discloses:

Further including a cue table that identifies various actions to be taken during execution of the lighting program in response to at least two inputs received at the cue table, wherein the cue table is coupled to the audio decoder to receive information identifying at least two characteristics of the audio input (i.e. Kiltz further discloses a gain to brightness transfer characteristic (fig. 2B) and a Frequency to color table (fig. 6) and;

during execution of the lighting program, generating at least one of the control signals in response to an output of the cue table (i.e. and each lamp driver controls the brightness output of a single light source in accordance with the audio amplitude envelope signal and the audio frequency band selected by the decode logic and activation of one or more lamp driver circuits to activate a plurality of colored light sources (LEDs) according to a preselected assignment of light color to each audio frequency band defined by the decode logic (col. 4 lines 49 – 65).

Regarding **Claims 47 and 54**, in addition to the elements stated regarding claims 35 and 51 the combination further discloses:

wherein at least one characteristic of the audio signal includes at least first and second characteristics (i.e. Kiltz further discloses a Frequency to color table with the frequency divided into ranges (fig. 6)

wherein the lighting program performs a mapping function from the first characteristic of the audio input to the at least one of the control signals and wherein the at least one of controller, during execution of the lighting program, changes the mapping function performed by the lighting program in response to the second characteristic of the audio input (i.e. the audio frequency band selected by the decode logic and activation of one or more lamp driver circuits to activate a plurality of colored light sources (LEDs) according to a preselected assignment of light color to each audio frequency band defined by the decode logic (col. 4 lines 49 – 65).

Regarding **Claim 48**, in addition to the elements stated above regarding claim 35, the combination further discloses:

wherein the lighting program is a first lighting program, wherein the at least one storage medium further stores a second lighting program, and wherein the at least one controller, during execution of the first lighting program, switches to execution of a second lighting program in response to the at least one characteristic of the audio input (i.e. Kiltz discloses a table of properties disclosing which lights are on when a certain frequency band is present (Fig. 6). It is inherent that as the frequency changes, so do the lighting schemes).

Regarding **Claim 51**, claim 35 as rejected above discloses all elements of claim 51 with the exception of a first program that controls a plurality of light emitting diodes

and a second program that processes an audio input to determine at least one characteristic of the audio input.

In the rejection applied above, a single program is used to do both of these tasks. However, splitting a program up into two separate programs is known in the art. Programmers often split tasks up in to subroutines or subprograms in order to improve the efficiency of a program. Applying this obvious variation to claim 51 in view of the applied elements above in claim 35 reads upon these limitations.

Claims 4, 18, 19, 23, 33, 34, 38, 49 – 50, 55, 57 – 60, 62 – 67, 69 – 74, 76 – 82, 84 – 89 and 91 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kiltz (U.S. Patent 5,191,319) in view of Eastty (U.S. Patent 6,021,204) in view of Suzuki (U.S. Patent 6,362,411) in further view of Drago (U.S. Patent 5,461,188).

Regarding **Claims 4, 23 and 38**, in addition to the elements stated regarding claims 1, 20 and 35, the combination fails to disclose wherein the act (B) includes an act

of determining a beat of the audio input, and wherein the at least one characteristic of the audio input relates to the beat.

The combinatoin discloses varying a lighting display based upon various audio properties (Kiltz abstract). As shown above, hardware and software are art recognized equivalents in such an area of application and thus are obvious variants or substitutes for each other for the purpose of control. Drago discloses a system includes a multiplicity of light sources such as light emitting diodes (LEDs) that may be of multiple colors and illuminate according to a program executed in synchrony with the rhythmic beat of either an independent internal or external music or sound program (col. 2 lines 49 – 58)

It would have been obvious to one of ordinary skill in the art at the time of the invention to use Drago's various features on the combination's audio lighting display. One would have been motivated to do so to further increase maximum creativity and audio visual flexibility when displaying lights in response to an audio input; col. 1 lines 5 – 15 in Drago.

Regarding **Claims 18, 33, 49, 59, 66, 73 and 81**, in addition to the elements stated above regarding claims 1, 20, 35, 57, 64, 71 and 78, the combination fails to disclose:

wherein the act (C) includes an act of executing the lighting program on a device coupled to at least one user interface; and

wherein the method further includes an act of, during execution of the lighting program in act (C), generating at least one of the control signals based at least in part on user input provided via the at least one user interface;

Drago discloses a system includes a multiplicity of light sources such as light emitting diodes (LEDs) that may be of multiple colors and illuminate according to a program executed in synchrony with the rhythmic beat of either an independent internal or external music or sound program (col. 2 lines 49 – 58) with a user interface circuit (fig. 1 element 20) which reads upon the limitation of wherein the act (C) includes an act of executing the lighting program on a device coupled to at least one user interface.

Through the user interface, via an interface signal, the sound and light programs to be processed by the CPU, can be selected, edited or additional programs added until the capacity of the program memory circuit is exceeded (col. 8 lines 20 – 25) which reads upon the limitation of wherein the method further includes an act of, during execution of the lighting program in act (C), generating at least one of the control signals based at least in part on user input provided via the at least one user interface).

It would have been obvious to one of ordinary skill in the art at the time of the invention to use Drago's various features on the combination's audio lighting display. One would have been motivated to do so to further increase maximum creativity and audio visual flexibility when displaying lights in response to an audio input; col. 1 lines 5 – 15 in Drago.

Regarding **Claims 19, 34, 50, 55, 60, 67, 74 and 82**, in addition to the elements stated regarding claims 1, 20, 35, 51, 57, 64, 71 and 78, the combination further discloses:

wherein the lighting program performs a mapping function from the at least one characteristic of the audio input to the at least one of the control signals (i.e. Kiltz further discloses a gain to brightness transfer characteristic (fig. 2B).

The combination fails to explicitly disclose a user interface, wherein the act (C) includes an act of executing the lighting program on a device coupled to at least one user interface and wherein the method further includes an act of, changing the mapping function performed by the lighting program in response to an input received from the user interface.

Drago discloses a system includes a multiplicity of light sources such as light emitting diodes (LEDs) that may be of multiple colors and illuminate according to a program executed in synchrony with the rhythmic beat of either an independent internal or external music or sound program (col. 2 lines 49 – 58) with a user interface circuit (fig. 1 element 20) which reads upon the user interface and wherein the act (C) includes an act of executing the lighting program on a device coupled to at least one user interface).

and through the user interface, via an interface signal, the sound and light programs to be processed by the CPU, can be selected, edited or additional programs added until the capacity of the program memory circuit is exceeded (col. 8 lines 20 – 25) which reads upon wherein the method further includes an act of, changing the mapping

function performed by the lighting program in response to an input received from the user interface.

It would have been obvious to one of ordinary skill in the art at the time of the invention to use Drago's various features on the combination's audio lighting display. One would have been motivated to do so to further increase maximum creativity and audio visual flexibility when displaying lights in response to an audio input; col. 1 lines 5 – 15 in Drago.

Regarding **Claim 57**, claim 35 as applied above teaches all elements of claim 57 except receiving an input from a timer and generating the control signal based upon the input from the at least one timer.

Drago discloses a system clock (fig. 1 element 14) and a pulse from the system clock sequences the memory circuit that then simultaneously produces the sound control signals and the light control signals in accordance with the audio and light programs (col. 6 lines 1 – 5). Applying this to the combination in order to change the audio output would thus change the LEDs displayed and read upon receiving an input from a timer and generating the control signal based upon the input from the at least one timer.

It would have been obvious to one of ordinary skill in the art at the time of the invention to use Drago's various features on the combination's audio lighting display. One would have been motivated to do so to further increase maximum creativity and

audio visual flexibility when displaying lights in response to an audio input; col. 1 lines 5 – 15 in Drago.

Regarding **Claims 58, 65, 72 and 80**, in addition to the elements stated regarding claims 57, 64, 71 and 78, the combination further discloses:

wherein at least one characteristic of the audio signal includes at least first and second characteristics (i.e. Kiltz further discloses a Frequency to color table with the frequency divided into ranges (fig. 6)

wherein the lighting program performs a mapping function from the first characteristic of the audio input to the at least one of the control signals and wherein the at least one of controller, during execution of the lighting program, changes the mapping function performed by the lighting program in response to the second characteristic of the audio input (i.e. the audio frequency band selected by the decode logic and activation of one or more lamp driver circuits to activate a plurality of colored light sources (LEDs) according to a preselected assignment of light color to each audio frequency band defined by the decode logic (col. 4 lines 49 – 65).

Regarding **Claims 62, 69, 76 and 84**, in addition to the elements stated above regarding claims 57, 64, 71 and 78, the combination further discloses:

an act of executing a lighting program having at least first and second variables that each has an input value, and wherein the act (D) includes an act of providing the at least one characteristic of the audio input as the input value of the first variable (i.e. Kiltz

further discloses a Frequency to color table with the frequency divided into ranges (fig. 6), the audio frequency band selected by the decode logic and activation of one or more lamp driver circuits to activate a plurality of colored light sources (LEDs) according to a preselected assignment of light color to each audio frequency band defined by the decode logic (col. 4 lines 49 – 65); and

the input from the at least one timer as the input value of the second variable (i.e. Drago discloses a pulse from the system clock sequences the memory circuit that then simultaneously produces the sound control signals and the light control signals in accordance with the audio and light programs (col. 6 lines 1 – 5)

Regarding **Claims 63, 70, 77 and 85**, in addition to the elements stated above regarding claims 57, 64, 71 and 78 the combination further discloses:

wherein the lighting program is a first lighting program, and wherein the method further includes an act of, during execution of the first lighting program in the act (C), switching to execution of a second lighting program in response to the input from the at least one timer (i.e. Drago discloses a pulse from the system clock sequences the memory circuit that then simultaneously produces the sound control signals and the light control signals in accordance with the audio and light programs (col. 6 lines 1 – 5).

Regarding **Claim 64**, the rejections of claims 35 and 57 above teach all limitations set forth in claim 64.

Regarding **Claim 71**, the rejections of claims 51 and 57 above teach all limitations set forth in claim 64.

Regarding **Claim 78**, the rejections of claims 35, 51 and 57 above teach all limitations set forth in claim 64.

Regarding **Claim 79**, in addition to the elements stated above regarding claim 78, the combination further discloses:

further including at least one timer (i.e. Drago discloses a pulse from the system clock sequences the memory circuit that then simultaneously produces the sound control signals and the light control signals in accordance with the audio and light programs (col. 6 lines 1 – 5).

Regarding **Claim 86**, claim 86 is made obvious for the same reasons stated above regarding the rejection of claim 1. The combination in claim 1, however, fails to explicitly disclose receiving an input form a graphical user interface and generating at least one of the control signals based on the input from the graphical user interface.

Drago discloses through a user interface, via an interface signal, the sound and light programs to be processed by the CPU, can be selected, edited or additional programs added (col. 8 lines 20 – 23).

Applying this to the combination disclosed in claim 1 would read upon the limitation receiving an input form a graphical user interface and generating at least one of the control signals based on the input from the graphical user interface.

It would have been obvious to one of ordinary skill in the art at the time of the invention to use Drago's various features on the combination's audio lighting display. One would have been motivated to do so to further increase maximum creativity and audio visual flexibility.

Regarding **Claim 87**, Kiltz discloses:

A method comprising acts of:

(A) processing information indicative of an audio input signal, wherein the audio input signal is in a digital music file format (i.e. fig. 1 element 70)

(B) determining at least one characteristic of the audio input signal (i.e. the decoder operates on the multiple binary signal to divide the audio frequency spectrum represented by these signals into a plurality of contiguous frequency bands (col. 4 lines 43 – 46)

(C) generating control signals to control a plurality of lights, wherein the lighting program is arranged to control the plurality of lights to display a lighting sequence comprising at least two lighting effects spaced in time (i.e. and activation of one or more lamp driver circuits to activate a plurality of colored light sources (LEDs) according to a preselected assignment of light color to each audio frequency band defined by the decode logic col. 4 lines 56 – 65 and, playing music is continuous, therefore, as one

segment of audio is played back, one effect will be displayed, as a second segment is played (followed continuously at a later time) a second effect will be displayed; as is shown in col. 3 line 26 which discloses multiple signals));

(D) generating at least one of the control signals based at least in part on the at least one characteristic of the audio input signal (i.e. activation of one or more lamp driver circuits to activate a plurality of colored light sources (LEDs) according to a preselected assignment of light color to each audio frequency band defined by the decode logic; col. 4 lines 56 – 65).

Kiltz does not explicitly disclose the method as a method for executing a lighting program or executing the lighting program to generating the control signals. Kiltz does disclose the generation of the control signals as shown above for controlling a plurality of lights. However, this is mostly done via hardwired logic as is shown in Fig. 1.

Suzuki discloses extracting control data from waveforms (abstract) and the invention may be implemented in hardware such as hardwired logic or software programs; col. 24 lines 44 – 61. While Suzuki is disclosing implementing the software portions of the invention into hardware, the inverse would also have to be possible (i.e. if software can be transformed and implemented into hardware, the hardware can be transformed and implemented in software.) Again, it should be stated that hardwired logic circuits and various other digital circuits as well as software logic are art recognized equivalents.

Modifying the combination to operate via a software program disclosed by Suzuki reads upon the lighting program and executing the lighting program to generate control

signals. A software program inherently requires a storage medium and thus reads upon the at least one storage medium to store the lighting program. Further, a controller such as a processor, must be inherently present in order to run the software and thus reads upon the at least one controller coupled to the audio decoder and the at least one storage medium. Assuming, for the sake of the argument, that these elements are not inherent, they are obvious variants. It is obvious to one of ordinary skill in the art that it is desirable, if not almost necessary to store a software program on a storage medium and execute it with a processor.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Kiltz hardware implementation to operate in a software environment. One would have been motivated to do so to reduce the number of parts required to produce the Kiltz invention as the combination would only require one processor instead of an entire hardwired circuit. The Suzuki reference substantiates the fact that hardware and software are art recognized equivalents in such an area of application and thus are obvious variants or substitutes for each other for the purpose of control.

Furthermore, the combinations fails to explicitly disclose the light sources as LEDs. However, the Examiner takes official notice that it would have been obvious to one of ordinary skill in the art to use LEDs in place of the lamps disclosed by the combination (this is further shown in Drago's use of LEDs in a similar invention, US 5,461,188 as cited in the IDS). One would have been motivated to do so to reduce the power consumption of the combination. It is well known in the art that LEDs typically

require less power to drive than standard lamps thus reducing this consumption would be desirable..

Additionally the combination fails to disclose the processing on the computer is done to generate a speaker-compatible signal from the audio input signal or transmitting the speaker compatible signal to generate audible sound indicative of the audio input signal.

Kiltz discloses a sound generating circuit which produces an audio output for playback by an audio transducer (Fig. 1). Applying this to the combination to act as the audio input source would read upon the limitations of the processing on the computer is done to generate a speaker-compatible signal from the audio input signal or transmitting the speaker compatible signal to generate audible sound indicative of the audio input signal.

It would have been obvious to one of ordinary skill in the art at the time of the invention to use Drago's various features on the combination's audio lighting display. One would have been motivated to do so to further increase maximum creativity and audio visual flexibility when displaying lights in response to an audio input; col. 1 lines 5 – 15 in Drago.

Regarding **Claim 88**, in addition to the elements stated above regarding claim 87, the combination further discloses:

processing information received from another device, indicative of an audio signal to generate the speaker compatible signal (i.e. Drago sound generating circuit (Fig. 1)

Regarding **Claim 89**, in addition to the elements stated above regarding claim 87, the combination further discloses:

an act of reading digital information, stored on a computer readable medium coupled to the computer, indicative of the audio signal to generate the speaker-compatible signal (Fig. 1 of Drago, the program memory circuit).

Regarding **Claim 91**, claim 91 is made obvious for the same reasons as claim 1 stated above. However, the combination shown in the rejection of Claim 1 fails to explicitly disclose (C) storing information related to the at least one characteristic of the audio input and (E) during execution of the lighting program in the act (D), reading the stored information and generating at least one of the control signals based at least in part on the at least one characteristic of the audio input.

Drago discloses storing audio and light program information (col. 6 lines 3 – 5) and producing the sound control signals and the light control signals in accordance with the audio and light programs stored (col. 6 lines 3 – 4). Applying this teaching to the combination would thus read upon the limitations of (C) storing information related to the at least one characteristic of the audio input and (E) during execution of the lighting

program in the act (D), reading the stored information and generating at least one of the control signals based at least in part on the at least one characteristic of the audio input.

It would have been obvious to one of ordinary skill in the art at the time of the invention to use Drago's various features on the combination's audio lighting display. One would have been motivated to do so to further increase maximum creativity and audio visual flexibility when displaying lights in response to an audio input; col. 1 lines 5 – 15 in Drago.

Claims 8, 26, 41 and 52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kiltz (U.S. Patent 5,191,319) in view of Eastty (U.S. Patent 6,021,204) in view of Suzuki (U.S. Patent 6,362,411) in further view of Bohn Jr. (U.S. Patent 6,618,031).

Regarding **Claims 8, 26, 41 and 52**, in addition to the elements stated above regarding claims 1, 20, 35 and 51, the combination does not explicitly disclose wherein the act (C) includes an act of transmitting pulse width modulated signals to the plurality of LEDs to control a perceived intensity of each of the plurality of LEDs.

The combination discloses lamp drivers (fig. 1 element 90 and Fig 4. element 90 in Kiltz). Bohn Jr. discloses that the on time of the PWM drive signal can be varied

within each frame to independently select the brightness of each LED (col. 5 lines 1 – 14)

It would have been obvious to one of ordinary skill in the art at the time of the invention to use Bohn Jr.'s PWM method as Kiltz's lamp drivers in order to use power more efficiently and to control the intensity efficiently. Bohn Jr. discloses resistor current sources use more power than the PWM method and the LED varies nonlinearly with both power supply voltage variations and LED forward voltage variations (col. 1 lines 47 – 61).

Claims 61, 68, 75 and 83 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kiltz (U.S. Patent 5,191,319) in view of Eastty (U.S. Patent 6,021,204) in view of Suzuki (U.S. Patent 6,362,411) in further view of Drago (U.S. Patent 5,461,188) and in further view of Bohn Jr. (U.S. Patent 6,618,031).

Regarding **Claims 61, 68, 75 and 83**, in addition to the elements stated above regarding claims 57, 64, 71 and 78, the combination does not explicitly disclose wherein the act (C) includes an act of transmitting pulse width modulated signals to the plurality of LEDs to control a perceived intensity of each of the plurality of LEDs.

The combination discloses lamp drivers (fig. 1 element 90 and Fig 4. element 90 in Kiltz). Bohn Jr. discloses that the on time of the PWM drive signal can be varied within each frame to independently select the brightness of each LED (col. 5 lines 1 – 14)

It would have been obvious to one of ordinary skill in the art at the time of the invention to use Bohn Jr.'s PWM method as Kiltz's lamp drivers in order to use power more efficiently and to control the intensity efficiently. Bohn Jr. discloses resistor current sources use more power than the PWM method and the LED varies nonlinearly with both power supply voltage variations and LED forward voltage variations (col. 1 lines 47 – 61).

Claim 56 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kiltz (U.S. Patent 5,191,319) in view of Eastty (U.S. Patent 6,021,204) in view of Suzuki (U.S. Patent 6,362,411) in further view of Pohlman (Principles of Digital Audio Third Edition).

Regarding **Claim 56**, in addition to the elements stated above regarding claim 51, the combination does not explicitly disclose that the audio input is in MP3 format.

Kiltz does discloses that the music source can be any means by which audio information is translated into electronic signals (col. 3 lines 26 – 31).
Pohlman discloses audio in an MP3 format (page 386 – 387). It would have been obvious to one or ordinary skill in the art at the time of the invention to apply MP3 encoded audio to Kiltz system. One would have been motivated to use MP3 audio as

disclosed by Pohlman in order to reduce the amount of memory required to store the audio.

Claim 90 is rejected under 35 U.S.C. 103(a) as being unpatentable over Drago (U.S. Patent 5,461,188).

Regarding **Claim 90**, Drago discloses :

A method for authoring a lighting program to control a plurality of light emitting diodes (LEDs) in response to at least one characteristic of an audio input (col. 8 lines 20 – 25)

(B) selecting, , at least one of the plurality of lighting effects to correspond to at least one of the plurality of LEDs in response to the at least one characteristic of the audio input (i.e. through this user interface 20, via an interface signal, the sound and light programs to be processed by the CPU, can be selected, edited or additional programs added (col. 8 lines 20 – 25); and

(C) creating a lighting program, based on the at least one user input for generating control information for the plurality of LEDs, wherein the lighting program is arranged to control the plurality of LEDs to display a lighting sequence comprising at least two lighting effects spaced in time (i.e. playing music is continuous, therefore, as one segment of audio is played back, one effect will be displayed, as a second segment

is played (followed continuously at a later time) a second effect will be displayed; as is shown in col. 3 line 26 which discloses multiple signals).

Drago does not explicitly disclose:

(A) providing a graphical user interface (GUI) that displays information representative of the plurality of LEDs, a plurality of lighting effects to be assigned thereto, and the at least one characteristic of the audio input (Fig. 2 element 20); or selecting the at least one of the plurality of lighting effects based on the at least one user input via the GUI.

However, Drago discloses a user interface that allows a user to select, edit or add additional programs; col. lines 20 – 25. It would have been obvious to add a GUI either in the form of a standard screen such as a pc monitor or an alphanumeric led display. It would be desirable to provide feedback to the user during the various processes.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew C. Flanders whose telephone number is (571) 272-7516. The examiner can normally be reached on M-F 8:30 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sinh Tran can be reached on (571) 272-7546. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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